



Original communication

## Suicidal hanging in Kuwait: Retrospective analysis of cases from 2010 to 2012



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### ABSTRACT

Suicide is an important health hazard worldwide. We retrospectively analyzed the autopsy records of the Institute of Forensic Medicine between 2010 and 2012 to document the characteristics of fatalities resulting from hanging in Kuwait. Upon analysis of death scene investigation and autopsy reports together with the information gathered from the police, the cases of hanging fatalities of suicidal origin were selected. A retrospective study was carried out on 118 suicidal hanging cases autopsied at Forensic Medicine Center in Kuwait (from 2010 to 2012). Of these cases, 86 (73%) were males and 32 females (27%). There was an increasing trend of hanging among ages between 21 and 50 years (87.3%) and the third decade had the highest number of victims (about 43%) between all age groups. Local Kuwaiti nationals comprised a small proportion of cases (7 persons, 5.9%), while the others were foreigners working in Kuwait with an Indian precedence (54 persons, 54.8%), followed by other 12 different nationalities representing 39.3% of the cases.

In conclusion, there was a decreasing trend of suicide by hanging in Kuwait from 44 cases in 2010 to 25 cases in 2012.

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### 1. Introduction

Suicide is one of the most important public health problems worldwide. Pattern of suicidal deaths reveals the existing social and psychological state of mind of the people of a region. Suicidal behavior, pattern and rates differ in various populations and culture.<sup>1</sup> It is reported to be an increasingly common way of attempting suicide in many countries. It is estimated that globally in 2000, 815,000 people killed themselves; making the suicide the 13th leading cause of death.<sup>2</sup>

The choice of method used to commit suicide depends on availability of means, knowledge about lethal effectiveness, and victim's motivation. Preference of method of suicide in men and women is complexly determined.<sup>3</sup>

According to Shari'ah doctrine, the definitive Islamic law, suicide is considered to be a criminal act to oneself.<sup>4</sup> Allah says explicitly in the Qur'an "And do not kill yourselves. Surely, Allah is most merciful to you".<sup>5</sup> In another verse of the Qur'an, Allah says: "And do not throw yourselves in destruction".<sup>6</sup>

Hanging is a form of ligature strangulation in which the force affecting the neck region is resulting from the gravitational drag of the weight of the body or part of the body.<sup>7,8</sup> The mode of death in hanging cases is almost always suicide or accident but, homicidal cases are also encountered in forensic autopsies though rarely.<sup>9</sup>

The ligature material commonly used is either the easily available clothing or a rope. In most cases, a ligature mark is present on the neck. There are a number of mechanisms by which hanging may cause death, that act either independently or in concert. These include stretching of the carotid complex causing reflex cardiac arrest; venous and arterial occlusion; airway obstruction; disruption of the spinal cord, etc. In autopsies of strangulation cases including hanging, the important aspect of the post-mortem

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**Table 1**

The distribution of the cases according to years and gender.

| Gender/year | Male no (%) | Female no (%) | Total no (%) |
|-------------|-------------|---------------|--------------|
| 2010        | 38 (73)     | 14 (27)       | 52 (44.1)    |
| 2011        | 28 (74)     | 10 (20)       | 38 (32.2)    |
| 2012        | 20 (71)     | 8 (29)        | 28 (23.7)    |
| Total       | 86 (73)     | 32 (27)       | 118 (100)    |

examination is the careful analysis of neck organs. These internal cervical findings (bruises in soft tissue, fracture in hyoid bone and/or thyroid cartilage) play a decisive role in the diagnosis of these cases.<sup>10</sup>

This retrospective research is done with an aim to develop the victimologic profile of suicidal hanging in Kuwait, and to document the characteristics of death cases resulting from hanging.

## 2. Materials and methods

Autopsy or post-mortem examination is imperative when death is sudden, unexpected, suspicious or unnatural. The study design is a retrospective study based on the autopsy records of the Institute of Forensic Medicine that is responsible for the post-mortem examination of all forensic deaths in Kuwait.

We retrospectively analyzed the autopsy records of the Institute during the three-year period between the years 2010 and 2012. Upon analysis of death scene investigation and autopsy reports together with the information gathered from the police, the cases of hanging fatalities of suicidal origin were selected. Cases with little or deficient information about the manner of death were excluded.

## 3. Results

One hundred eighteen hanging cases of suicidal origin were detected and evaluated in terms of demographic features, as regard country of origin and Gender, the type of hanging material used for ligature, cause of death, internal findings in neck organs, others traumatic findings suggesting the use of another method for suicide, toxicological findings and microscopic findings in specimens taken for pathological cases.

Between 2010 and 2012, there were 118 cases of suicidal hanging. There was a decreasing trend of suicide by hanging in Kuwait. The distribution of cases in respect to gender and years is shown in Table 1. 86 of those (73%) were male, and had a rate nearly 2.5 times more than that of females (32 cases, 27%).

There was no case aged lower 10 and the number of the cases in the age group of cases aged over 60 was the lowest ( $n = 2$ , 1.7%), as shown in Fig. 1. There was an increasing trend of hanging among ages between 21 and 50 years (87.3%), and the highest number of victims was in the third decade (about 43%).

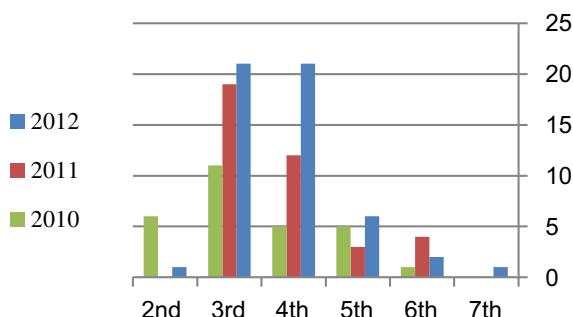


Fig. 1. Distribution of cases according to age group decade.

**Table 2**

Classification of suicidal hanging cases according to nationality.

| Nationality | Year 2010 no | Year 2011 no | Year 2012 no | Total no (%) |
|-------------|--------------|--------------|--------------|--------------|
| Kuwaiti     | 1            | 4            | 2            | 7 (5.9)      |
| Afghanistan | 0            | 1            | 0            | 1 (0.8)      |
| American    | 0            | 0            | 1            | 1 (0.8)      |
| Bangladeshi | 6            | 0            | 2            | 8 (6.8)      |
| Ceylon      | 1            | 1            | 1            | 3 (2.5)      |
| Egyptian    | 1            | 2            | 1            | 4 (3.4)      |
| Ethiopian   | 2            | 6            | 4            | 12 (10)      |
| Filipinas   | 1            | 0            | 0            | 1 (0.8)      |
| Indian      | 25           | 18           | 11           | 54 (54.8)    |
| Indonesian  | 2            | 1            | 0            | 3 (2.5)      |
| Nepal       | 12           | 2            | 2            | 16 (13.6)    |
| Pakistani   | 1            | 1            | 0            | 2 (1.7)      |
| Syrian      | 0            | 1            | 2            | 3 (2.5)      |
| Yemen       | 0            | 0            | 1            | 1 (0.8)      |
| Total       | 52           | 38           | 28           | 118 (100)    |

Foreigners working in Kuwait represented the highest percentage of suicide by hanging cases (94.1%) with an Indian precedence (54 persons, 54.8%), followed by Nepal nationals (16 persons, 13.6%), followed by Ethiopian (12 persons, 10%) and other 10 different nationalities (21.6%) with less than nine persons in each in the order of Bangladeshi, Egyptian, Ceylon Indonesian, Syrian, Pakistani, Afghanistan, American, Filipinas and Yemen persons as shown in Table 2.

In 72 of these cases suspension was complete and in 46 incomplete. Fractures in neck organs were detected in 52 of cases. In fracture-determined cases, fracture in hyoid bone was seen in 23 (Fig. 2), in thyroid cartilage in 15, in both hyoid and thyroid in 11. Vertebral fracture was detected in two cases and fractures both in hyoid, thyroid and vertebra were found in one case as shown in Table 3.

In most of cases, the place of hanging was the subject's own house, most victims selected rope for the ligature with the rest using sheet, belt, cable and necktie. There were traumatic findings showing attempts of suicide other than hanging.

The findings of death scene investigation together with internal findings obtained at autopsy revealed the origin of hanging being suicide.

## 4. Discussion

The human neck is vulnerable to many types of life threatening compression injuries like hanging due to its relatively small diameter, lack of bony support, close relation to the airway, spinal cord and major vessels. For this reason, this region was used for



Fig. 2. A) Hyoid bone fracture of right horn. B) Radiology of previous photo.

**Table 3**

The relation between type of hanging and type of fracture.

| Type of hanging/type of fracture | Complete no (%) | Incomplete no (%) | Total no (%) |
|----------------------------------|-----------------|-------------------|--------------|
| 1) Hyoid                         | 17              | 6                 | 23 (19.5)    |
| 2) Thyroid cartilage             | 12              | 3                 | 15 (12.7)    |
| 3) Vertebral#                    | 2               | 0                 | 2 (1.7)      |
| 4) Both 1&2                      | 8               | 3                 | 11 (9.3)     |
| 5) All                           | 1               | 0                 | 1 (0.8)      |
| Present fractures                | 40              | 12                | 52 (44%)     |
| Absent fractures                 | 32              | 34                | 66 (56%)     |
| Total                            | 72(61%)         | 46(39%)           | 118 (100)    |

1) Hyoid bone fracture 2) Thyroid cartilage fracture 3) Vertebral fracture 4) Hyoid bone & thyroid cartilage fracture 5) Hyoid bone, thyroid cartilage and vertebral fracture.

execution of judicial sentence and also preferred by suicide victims in many cultures.<sup>11,12</sup>

There were 118 suicidal hanging fatalities in Istanbul between the years 2010 and 2012.

There seems to be a decreased in the number of suicidal hanging fatalities with increase in population of this crowded city. That in controversy to a study was done in Istanbul, Turkey.<sup>13</sup>

Hanging is a leading method of suicide in Germany and Japan and it is the second leading suicide method after intoxications in India.<sup>14</sup> In US, despite the fact that the suicide patterns differ according to the states, hanging was reported to be the second leading method of suicide after firearms in general.<sup>15</sup>

Suicidal hanging in Kuwait is a predominantly male affair with 73% of cases being male and only 27% of those being female. This figure contrasts with high incidence of hanging in woman (40%) reported in Denmark by Simonsen<sup>16</sup> and those of London, Northern Ireland.<sup>17,18</sup> The preponderance of male cases in suicidal hanging fatalities is a common feature in some of other studies like Cardiff study and in general males constitute approximately 60% of these cases.<sup>7</sup>

Most of the victims were found to be in 20–29 age group and these cases constituted 43% of all cases. That is in agreement with Ibrahim.<sup>13</sup>

The Indian nationality represented nearly half the number of cases in the current study (54 persons, 54.8%). This is can be explained by the matter of fact that many foreigners from south east Asia are working in the Eastern Province, the majority of them are Indians.<sup>29</sup> These results are closely similar to a study done in Bahrain, an Islamic country in the Gulf region, in which the mean suicide rate was 0.6 per 100,000 for the Bahraini nationals and 12.6 per 100,000 for the non-Bahrainis and 17.7 per 100,000 for the Indian migrants.<sup>30</sup> The Bahraini study supports the influence of foreigners on the overall incidence and pattern of suicide. The lower number of Kuwaiti suicidal cases (5.9% of cases, all are Muslims) can also be explained by the fact that suicide is stigmatized and condemned by the Islamic Doctrine in Kuwait. In addition, the highest standard of living and working of Kuwaiti citizens, as well as the dominant community condemning suicide acts, might have a great role in decreasing this rate.

Fractures in neck organs were detected in 52 (44.07%). In fracture-determined cases, fracture in hyoid bone was seen in 19.5%, in thyroid cartilage in 12.7%, in both hyoid and thyroid in 9.3%. Vertebral fracture was detected in two cases and fractures both in hyoid, thyroid and vertebra were found in one case.

The reported incidence of fractures in hanging fatalities of different studies differ markedly as seen in Table 4 (e.g., Inanici<sup>26</sup> reported it to be 30%; James<sup>7</sup> reported to be 36%). It ranges between 0.8% and 59% in different studies. Findings of neck organs in different autopsy series are shown in Table 4. As seen in the table there is a marked discrepancy between the findings reported by

**Table 4**

Trauma to the hyoid bone and thyroid cartilage in hanging in different series.

| Study                                | The number of cases | Fracture in neck organs (n) | %     |
|--------------------------------------|---------------------|-----------------------------|-------|
| Sen Gupta <sup>19</sup>              | 101                 | 0                           | 0     |
| Zavilla <sup>20</sup>                | 363                 | 3                           | 0.8   |
| Jonas and Greifova <sup>21</sup>     | 1000                | 76                          | 7.6   |
| Doichinov and Simeonov <sup>22</sup> | 375                 | 57                          | 15.2  |
| Luke <sup>23</sup>                   | 28                  | 7                           | 25.0  |
| James and Silcocks <sup>7</sup>      | 84                  | 30                          | 36.0  |
| Dietz <sup>24</sup>                  | 233                 | 127                         | 54.0  |
| Polson <sup>25</sup>                 | 80                  | 44                          | 55.0  |
| Inanici <sup>26</sup>                | 50                  | 15                          | 30.0  |
| Current study                        | 118                 | 52                          | 44.07 |

different authors and this reflects the absence of standardization in examination methods.

Forensic pathologists commonly evaluate the neck organ complex at autopsy via visual and palpatory examination. This examination is carried out by exposing the organ complex either in situ or after removal of the trunk organ complex. However, it is reported that only the fractures of the cornua of the hyoid bone and thyroid cartilage can be detected by this way. Infarctions and fissures with slight or no displacement can be masked by soft tissue.<sup>25</sup> It was also reported that injuries of lamellae of the thyroid cartilage, cricoid cartilage, and trachea could not be detected only by visual and palpitory examination. Elasticity of the cornua or the effect of decomposition was also proposed factors to lead to false outcomes in palpitory examination.<sup>27</sup> For this reasons some authors emphasize the importance of careful preparation of the hyoid bone and laryngeal cartilages in the laboratory to reveal every injury and to minimize the effects of these negative factors.<sup>28</sup> In a study comparing the classical method and preparation method, the ratio of false diagnosis for hyoid bone was reported to be 5% and 17% for thyroid cartilage after stereoscopic analysis of prepared specimens. The ratio of fractures was reported to be 76.6% in suicidal hanging fatalities by Stereomicroscopy.<sup>28</sup> This ratio is relatively high when compared to the findings of other series. Based on these data one can conclude that important part of the injuries remain undetected during the routine visual and palpitory examination.

In forensic autopsies of these cases we also use the palpitory and visual examination method for search of fractures and the percentage of fracture-determined cases of our series is about 44%. For this reason, visual and palpitory examination method must be regarded as preliminary method and stereomicroscopic investigation of the completely prepared organocomplex must be the prime investigation process.

#### Ethical approval

None.

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#### Conflict of interest

None.

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